

XX. *On the early stages of Latorina (Lycaena) pyrenaica, Boisd.* By T. A. CHAPMAN, M.D.

[Read October 6th, 1915.]

PLATES LXV—LXXXII.

MY first critical examination of *L. pyrenaica* is recorded in the Trans. Ent. Soc. Lond. 1905, p. 307, and in the Transactions for 1911, p. 148, I was able to give some facts as to the early stages of *L. orbitulus*. Since rearing *L. orbitulus*, it seemed that it would be very desirable, if possible, to learn something of the life-history of *L. pyrenaica*, but it was only last year (1914) that I was able to make an effort to put this desire into action. As a matter of fact, whatever the truth may be, I persuaded myself that I selected Gavarnie, rather than any other place amongst the hills, for an excursion in July 1914, entirely in order to investigate the life-history of *L. pyrenaica*.

One is seldom as successful as one wishes to be, but I succeeded in following out the main outlines of the earlier stages of our butterfly, notwithstanding various difficulties, some anticipated, some wholly unexpected.

Accepting the close relationship of *pyrenaica* to *orbitulus*, the presumption was very strong that it fed on some primulaceous plant. Visiting several localities where I knew *L. pyrenaica* to occur, I soon found that they all agreed in having *Androsace villosa* as a substantial part of their flora; the other *Androsaces* and *Primulas* found at Gavarnie were usually absent from such localities. Several spots where *A. villosa* grew, even sparsely, but where I did not know *L. pyrenaica* to occur, afforded specimens of that butterfly on a little patient examination.

The first specimens of the butterflies (two males) were seen on July 14, but it was in the third and fourth weeks of July that the species was fully out. During this period eggs were obtained by placing the females with plants of the *Androsace*, and one specimen was seen laying on it in the field, others examined it, with that object no doubt, but a deposited egg was not found. I have to thank M. Rondou for showing me one or two localities for *L. pyrenaica* that

I had not previously visited, which materially assisted me in obtaining eggs.

The eggs are laid in the little rosettes of leaves of the food-plant, right down between the leaves, so as rarely to be visible without separating them, and often as near the centre as affords leaves large enough to have openings between them, but also further out and even on quite outside leaves.

On my last day at Gavarnie (August 1st) I obtained some more butterflies in order to secure a further supply of eggs, but on the 2nd I left Gavarnie and was a week on the way home. By good luck it happened that none of the eggs I had obtained hatched until just as I got home on the afternoon of August 9th, or so immediately before that they managed to find food in the plants on which the eggs had been laid.

The egg of *pyrenaica* is 0.625 mm. in diameter, the margins well rounded from the upper to the under surface, the top itself being somewhat dome-shaped, not flat as in many *Agriades*. The micropylar area is about 0.125 mm. across, and has about seven cells that would be crossed by a line from centre to circumference, but they are hardly regular enough to say there are seven circles. The cells of the network are about 0.03 mm. in diameter, the lines of netting have hardly any eminences at their junctions on top, but these are present though small on the sides.

Comparing this egg with that of *orbitulus* (see Trans. Ent. Soc., 1911, Pl. XII), we find that the size and form are in very close agreement. But in other respects the differences are considerable. In *orbitulus*, the micropylar area is much smaller, only about half the diameter, 0.064 mm. instead of 0.125 mm., and the number of cells make only four or five rings, if we count them in the circles they don't quite arrange themselves in. Even though it be inaccurate to talk of circles, there are nevertheless seven cells from centre to margin counted in the same way as only give four or sometimes five in *orbitulus*. Similarly, there are about seven cells from the micropylar area to the margin in *pyrenaica*, where similar counting gives quite nine in *orbitulus*. The cells are smaller in *orbitulus*, look much more numerous, and have much more fully-developed prominences or pillars where the lines of network meet.

The following notes as made refer to the rearing of the larvae, etc. :—

Aug. 9th, 1915.—On arrival home from Gavarnie, found an egg that was discovered naturally laid had hatched, and from the situation of some traces of frass it was obvious that the larva had penetrated into the centre or base of the central bulb of leaves. An examination of other eggs led to the belief that none had hatched.

Aug. 10th.—Found that several eggs of *pyrenaica* had hatched, and the bulbs in which they were being very wasted, the larva were extracted and placed on growing plants. The larvae in one or two cases were free and newly hatched, but several were found beneath the central growing point in the top of the stem; sometimes a trace of frass showed where it had entered, in other cases there was no indication externally; the place seemed to be between what was the nearly solid central ball and one of the next free leaves. The other eggs (unhatched) were placed one each on the bulbs of growing plants.

Aug. 13th.—All the eggs appear to have hatched; here and there a little frass shows where the larvae have disappeared, but for the most part there is no indication of what has become of them, though they are no doubt in the tops of the stems just below the growing point. In one case only, a larva is seen in the interior of one of the larger leaves, where it has mined out all the green material, leaving the colourless, translucent cuticles.

Aug. 20th.—Found various heads of *Androsace*, with the centres loose and dead, the larvae having eaten their bases; in several cases the larvae were seen, apparently (but not certainly) still in 1st instar; in other cases the larvae had either gone off elsewhere or had eaten down into the root stock, as was suggested by frass covering the centre when the dead central bud was removed. One larva seen was very fat, nearly black, and very glabrous and shining; another had black with paler longitudinal stripes, the black predominating; in two cases, the central loose bud being removed, the larvae were seen to be in the interior of an adjoining leaf.

Aug. 21st.—A larva not wholly black has a broad black dorsal band, then a pale band, then a broad black band down to lateral flanges, the hairs of which are on a large pale patch in each segment. The dark band on slope has various pale spots, especially a large patch about the middle of it (on each segment); the length of the larvae is barely 2 mm. stretched. Head black, legs black, but the plates too thin

and translucent, except at ends, to prevent their looking paler from contents. They are still in 1st instar; the black pigment is in the subcutaneous layer.

Aug. 31st.—Found three larvae of *L. pyrenaica* on two of the plants of *Androsace villosa* sent home to establish a few plants for further necessities. The eggs of these must have withstood the perils of travel to which the plants were subjected. Roughly rolled in paper and sent by sample post, which had very satisfactory results as regards the plants, and, in this instance, without damage to the eggs of *L. pyrenaica*. It is not unlikely that other plants also had on them some eggs which did suffer, at any rate no other stock plant sent home shows any trace of larvae of *L. pyrenaica*.

Aug. 31st.—A larva is detected obviously in 2nd instar; it is very dark, there is a dorsal paler (dark cinereous) line with a broader quite black line on either side of it down the dorsal flanges, below this another dark cinereous band, and below this (from above middle of slope downwards) the black is relieved by various cinereous mottlings. The hairs are rather larger and more conspicuous than in 1st instar. This larva is just under one side of a central bulbil that has been a good deal eaten and destroyed.

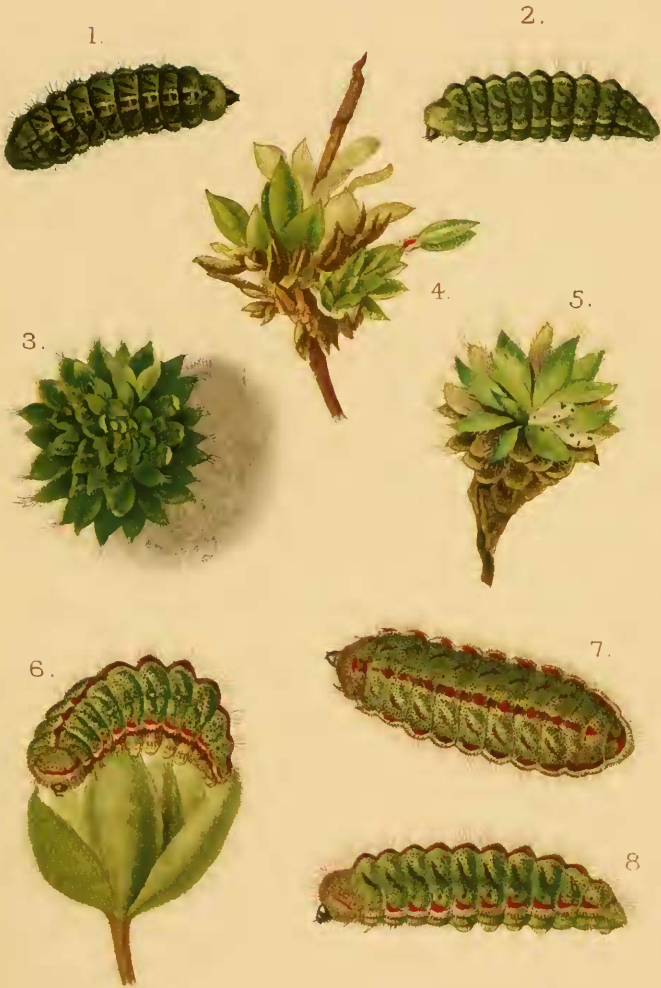
Sept. 9th.—Various larvae can be found apparently about full grown in 2nd instar; they still mine out the interior of the small leaves.

At this same date *escheri* hatched same time are full grown in 3rd instar and thinking of hibernating, some having stopped feeding.

The larvae continued to grow slowly, sometimes they fed under the central bud, in other instances they were seen actually inside the larger leaves, which they mined out more or less completely; some rosettes had all the leaves so cleared out, leaving merely the cuticle, both upper and under, in the form of the leaf, but nearly colourless instead of green. As they approached their full growth, in 3rd instar, for hibernation they were very difficult to see or find.

They were placed for the winter on their food-plants, undisturbed, just as they had hidden themselves, some out of doors, some in a refrigerator, and some in a cold room. A certain number survived the winter, but I failed to get any of them to commence feeding in the spring.

Oct. 6th.—The larvae are not to be seen, but the plant



E. F. Knight, del et pinx.

Adlard & Son and West Newman

LARVAE OF *L. PYRENAICA*.



1.



2.



3.

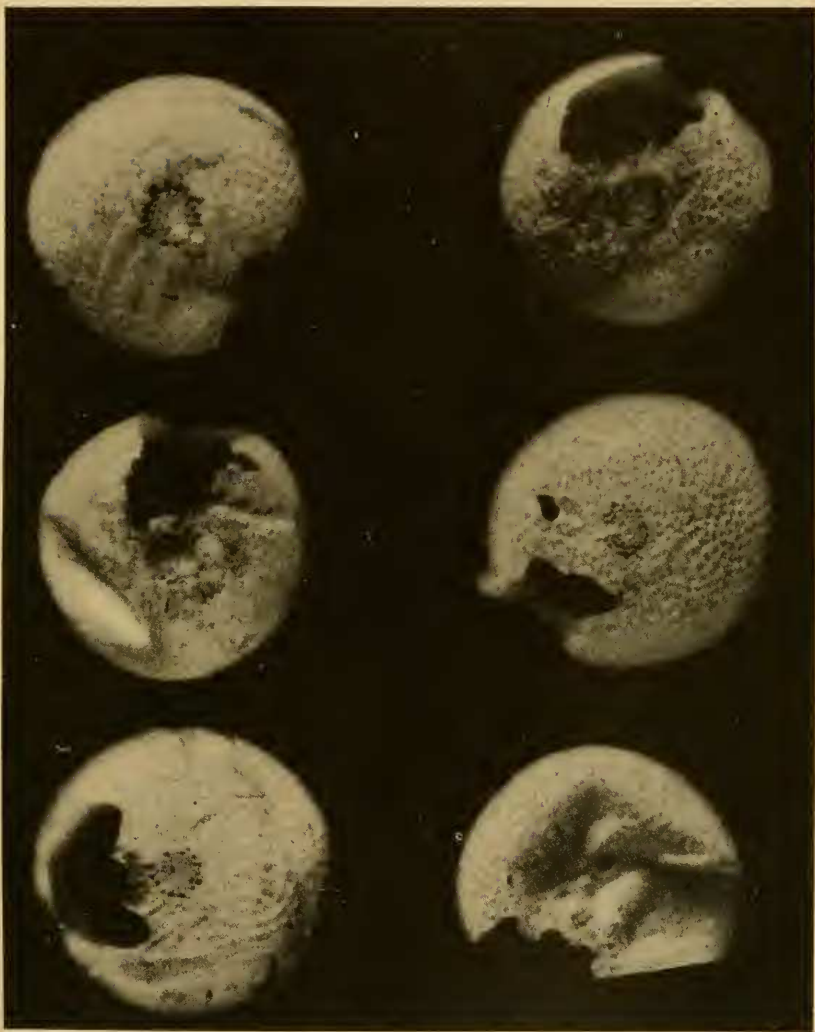


4.

E. C. Knight, del. et pinx.

Adlard & Son and West Newman

SKINS OF PARASITISED LARVAE, *P. EROS* & *L. PYRENAICA*.

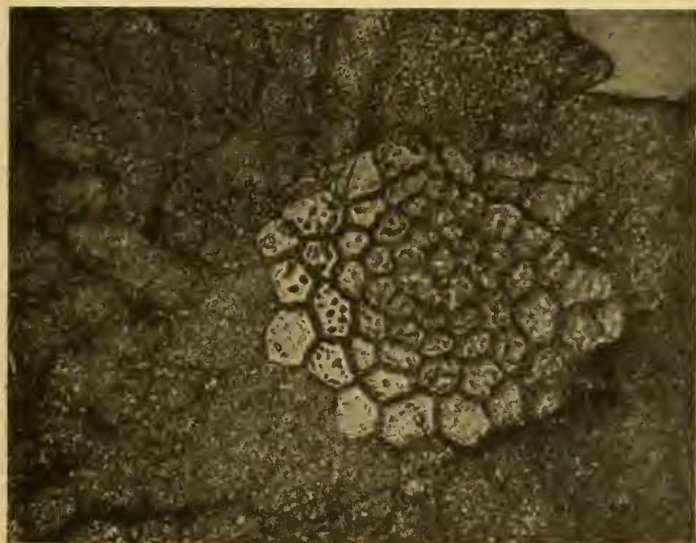


Photo, F. N. Clark.

Anglo-Engraving Co., Ltd.

L. PYRENAICA, EGGSHELLS $\times 60$.

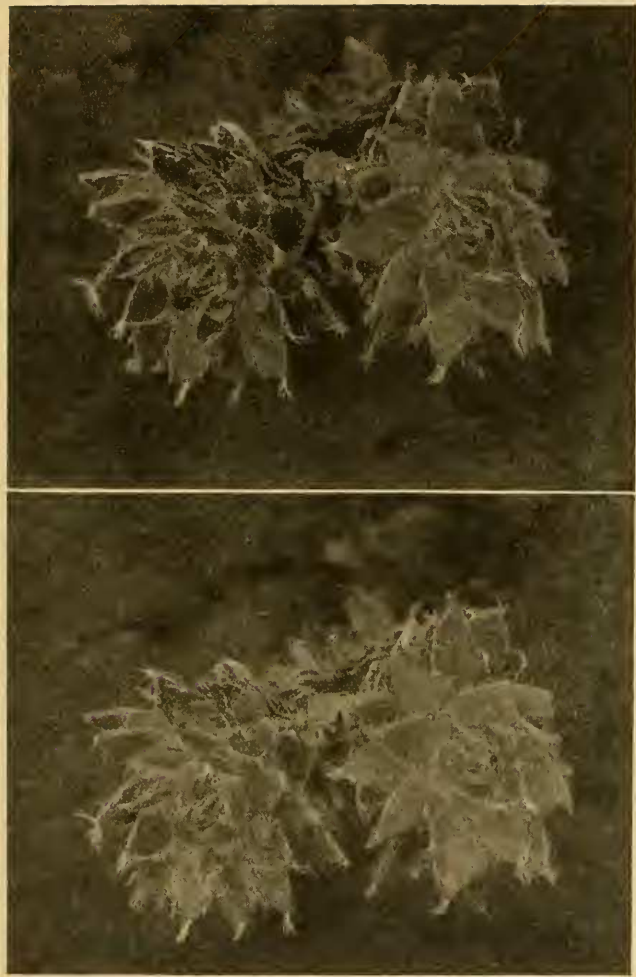
Trans. Ent. Soc. Lond., 1915, Plate LXVIII.



Photo, F. N. Clark.

Anglo-Engraving Co., Ltd.

L. PYRENAICA, EGG AND MICROPYLE $\times 60$ and $\times 350$.



Photo, A. E. Tonge.

Anglo-Engraving Co., Ltd.
L. PYRENAICA, ROSETTES OF A. VILLOSA WITH EGGS. STEREOGRAPHIC × 5.

